The Feed the Future Innovation Lab for Collaborative Research on Sustainable Intensification (SIIL)

Sustainable intensification through better integration of crop and livestock production systems in the Sahelian zone of Burkina Faso


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Background

Despite decades of investment to develop the region, West Africa continues to be plagued by high levels of poverty and food insecurity (Ayantunde et al. 2018). Climate change and projected population growth are expected to increase both production variability and demand for agricultural products through 2050 (Zougmore et al. 2016), putting further pressure on agricultural systems to keep pace.

Sustainable intensification of agricultural production has become a predominant theme in development agendas not only in the region, but in sub-Saharan Africa (Garnett et al. 2013). This has been defined as the ability to produce more food on the same amount of land for an indefinite duration into the future while maintaining the integrity of ecosystems and the environmental resource base supporting that production (Pretty et al. 2011). Despite some projections of stagnating or even negative annual growth in crop and livestock productivity in the years preceding 2050 (Knox et al. 2012), other assessments have indicated that significant potential remains to fill yield gaps in major cereal crops through intensification efforts such as improved practices and agricultural management (Ayantunde et al. 2018; Tittonell and Giller 2013).

The Sustainable Intensification Innovation Lab program

The Feed the Future Innovation Lab for Collaborative Research on Sustainable Intensification (SIIL), is led by Kansas State University, and supports the Feed the Future goals of reducing global hunger, poverty and undernutrition.

Along with the associated Geospatial and Farming Systems Research Consortium and the Appropriate Scale Mechanization Consortium, SIIL will produce measurable impacts on reducing global hunger, poverty and improving the nutrition of smallholder farmers.

SIIL works in six focus countries: Bangladesh, Ethiopia, Burkina Faso, Senegal, Tanzania and Cambodia.

Activities are focused on four core areas:

- Sustainably increase the production of nutritious food and encourage dietary diversity of smallholder and women farmers.
- Increase the involvement and empowerment of women in agricultural production and processing.
- Increase food production through improved crop-production technologies while minimizing environmental impact.
- Prevent food loss and waste and improve food safety.

SIIL in Burkina Faso

In Burkina Faso, the overall goal of this project is to improve household food production and nutrition and to enhance ecosystem services through better integration of crop and livestock production systems.

The Burkina Faso project is led by the International Livestock Research Institute. Other partner institutions include: The International Union for Conservation of Nature (IUCN), Institut de l'Environnement et de Recherches Agricoles (INERA), La Fédération Nationale des Groupements Naam (FNGN), Association pour la Promotion de l'Elevage en Savane et au Sahel (APESS) and University of Wisconsin–Madison.

Objectives

In Burkina Faso, SIIL aims to:

1 Increase crop and livestock integration in mixed systems through improved crop production (dual purpose sorghum and cowpea varieties), soil fertility (application of manure and inorganic fertilizer), water harvesting (zai and stone-bunding with vegetation strips) and livestock feed enhancing interventions (forage sorghum, dual-purpose cowpea and efficient feeding systems).

2. Assess the economic, social, nutritional and environmental benefits and trade-offs of productivity-enhancing interventions and potential for cost-efficient out scaling.

3. Build capacity of smallholder farmers and researchers on sustainable intensification and improved nutrition through multi-stakeholder platforms.

Approach

SILL is a research project and its activities will be solution focused to meet the needs of farmers and will be implemented at both household and community levels in Dori and Ouahigouya districts in the Sahelian zone of Burkina Faso, with rainfall between 300 and 600 mm per year. The main underlying hypothesis is that there is great potential for smallholder farmers currently engaged in crop-livestock systems to produce more in a given area of land, thereby improving productivity, food security and nutrition while preserving the ecosystem.

SILL will use research approaches that are diverse and integrated ranging from community and household surveys using focus group discussion and semi-structured interviews, to participatory action research on proposed combination of technologies through mother-baby trials for improved dual-purpose crops over at least two cropping seasons and feeding trials for sheep fattening.

Specifically, project activities will include:

- Baseline characterization of the study sites.
- Agronomic trials involving improved dual-purpose sorghum and cowpea varieties.
- On farm feeding trials with sheep.
- Cost-benefit analysis of productivity enhancing interventions.
- Analysis of intensification options on gender and household nutrition.
- Monitoring of consumption of animal source foods (milk) and other food sources by women and children.
- Analysis of socio-economic aspects behind variation in natural resource management and nutritional status.
- Capacity building of farmers and researchers.

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Expected outcomes

Expected outcomes from the project activities are:

1. Improved food and nutrition security of poor farmers through increased crop and livestock productivity, and technical and social innovations.
2. Enhanced natural resource base through technical and institutional interventions that are environmentally friendly and gender sensitive.
3. Research outputs are translated into solutions that benefit smallholder farmers through institutional innovations that harness competence and knowledge of different stakeholders to jointly diagnose, identify problems/opportunities and investigate solutions.

References

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